We claim:

1. A system for providing snapshot action thermal imaging within automated process control article inspection applications comprising:

a lead salt-based thermal infrared imager configured to support snapshot-mode image acquisition;

an image acquisition zone configured to support the snapshot-mode image acquisition of a part or process;

an image processor configured to receive and process output of the imager in a manner which reduces a two-dimensional infrared spatial image or data set produced by the imager into a specific set of quality- or process-related attributes associated with the part or process within the image acquisition zone; and

a control electronics module configured to provide image acquisition control signals within the system.

2. The system as set forth in claim 1 further comprising an automated conveyance device used to dynamically present a stream of parts in rapid succession to the system.

3. The system as set forth in claim 2 further comprising a part detect or presence sensing device which interfaces to the control electronics module and provides the system an indication of the presence of a part requiring inspection.

4. The system as set forth in claim 1 further comprising a thermal baffle disposed within the inspection zone to shield the imager from deleterious thermal infrared energy emanating from uncontrolled or non-preferred sources.

5. The system as set forth in claim 4 wherein the thermal baffle comprises high emissivity surfaces to facilitate absorption of the deleterious thermal infrared energy.

6. The system as set forth in claim 5 wherein the thermal baffle is actively cooled to reduce self-emission of thermal infrared energy.

7. The system as set forth in claim 6 wherein the thermal baffle is cooled using thermo-electric coolers.

8. The system as set forth in claim 1 further comprising a thermal energy stimulus used for imparting thermal energy to the part or process for differentiating defective parts from acceptable parts.

9. The system as set forth in claim 8 wherein the thermal energy stimulus is implemented as an induction-type heater.

10. The system as set forth in claim 8 wherein the thermal energy stimulus is implemented as an ultrasonic heater.

11. The system as set forth in claim 8 wherein the thermal energy stimulus is implemented as a microwave source.

12. The system as set forth in claim 8 wherein the thermal energy stimulus is implemented as a spatially-directed high power laser.

13. The system as set forth in claim 8 wherein the thermal energy stimulus is implemented as a blackbody emitter.

14. The system as set forth in claim 13 wherein the blackbody emitter is implemented as a lamp.

15. The system as set forth in claim 14 wherein the lamp is implemented as a quartz halogen lamp.

16. The system as set forth in claim 14 wherein the thermal energy emitted by the lamp is exchanged by way of natural convection.

17. The system as set forth in claim 14 wherein the thermal energy emitted by the lamp is exchanged by way of forced air flow.

18. The system as set forth in claim 13 wherein the blackbody emitter is implemented as a glowbar.

19. The system as set forth in claim 18 wherein the energy emitted by the glowbar is exchanged by way of natural convection.

20. The system as set forth in claim 18 wherein the energy emitted by the glowbar is exchanged by way of forced air.

21. The system as set forth in claim 1 wherein thermal infrared energy is added to the part by electrically energizing components associated with the part.

22. The system as set forth in claim 1 further comprising a status enunciator used to indicate a status of the part or process under inspection.

23. The system as set forth in claim 22 wherein the status enunciator is implemented as a mechanical reject mechanism which acts to remove specific parts from a manufacturing process when such parts are determined to be below or, alternately, above a predefined quality level.

24. The system as set forth in claim 23 wherein the reject mechanism is an air valve.

25. The system as set forth in claim 23 wherein the reject mechanism is a solenoid actuator.

26. The system as set forth in claim 22 wherein the status enunciator is implemented as a marking device which acts to mark parts determined to be below or, alternately, above a predefined quality level.

27. The system as set forth in claim 22 wherein the status enunciator is implemented as a print or display report writer that acts to provide a part-by-part quality report.

28. The system as set forth in claim 22 wherein the status enunciator is implemented as a print or display report writer that acts to provide a cumulative archive of article quality.

29. The system as set forth in claim 22 wherein the status enunciator is implemented as a module that electronically communicates part or process status in a manner which facilitates closed loop control of a manufacturing process.

30. A method for providing snapshot action thermal infrared imaging within an automated process control article inspection application, the method comprising the steps of:

simultaneously integrating thermal infrared signals within all pixel sites of a lead salt-based imager based on image acquisition control signals provided by an electronics control module;

providing a two-dimensional infrared spatial image or data set based on the pixel site integrating to a processor; and

processing the two-dimensional infrared spatial image or data set into a set of quality- or process-related attributes associated with a part or process under inspection.

31. The method as set forth in claim 30 further comprising the step of automatically conveying objects to be inspected into an inspection zone.

32. The method as set forth in claim 30 further comprising the step of applying thermal energy to parts under inspection for the purpose of differentiating defective parts from acceptable parts.

33. The method as set forth in claim 30 further comprising the step of generating a status report based on the processing.

34. The method as set forth in claim 33 further comprising the step of proving the status report to a status enunciator.

35. The method as set forth in claim 34 further comprising the step of using the status report to automatically alter parameters of a manufacturing process.

36. A method for providing snapshot action thermal infrared imaging within an automated process control article inspection application, the method comprising the steps of:

energizing components within an inspected part or process by applying a controlled voltage or current to the components;

simultaneously integrating thermal infrared signals within all pixel sites of a lead salt-based imager based on image acquisition control signals provided by an electronics control module;

providing a sequence of two-dimensional infrared spatial images or data sets based on the pixel site integrating to a processor; and

processing the two-dimensional infrared spatial images or data sets into a set of quality- or process-related attributes associated with a part or process under inspection.

37. The method as set forth in claim 36 further comprising the step of generating a status report based on the processing.

38. The method as set forth in claim 37 further comprising the step of providing the status report to a status enunciator.

39. The method as set forth in claim 38 further comprising the step of using the status report to automatically alter parameters of a manufacturing process.